

**Method For Manufacturing Semiconductor Device  
Having Porous Structure With Air-Gaps**

Abstract of the Disclosure

[0059] A method for manufacturing a semiconductor device includes: (i) depositing a sacrificial layer made of an organic polymer such as benzocyclobutene on a substrate having a circuit formed thereon; (ii) etching the sacrificial layer except for a portion where air gaps are to be formed; (iii) depositing a low-dielectric layer over the substrate until the portion for air gaps is entirely enclosed in the low-dielectric layer; (iv) etching the low-dielectric layer to form via holes and trenches there through; (v) prior or subsequent to step (iv), removing the portion for air gaps; and (vi) depositing copper in the vias and trenches which are filled with the copper contacting a surface of the substrate.

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